Identifying the Sources of Financial Volatility

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Abstract: Our primary goal is to develop and analyze a dynamic economic model that takes into account several sources of information-based trade—the markets for a stock and options on that stock—and that ultimately accounts for salient features of stock price data, including serial correlation in stock trades, serial correlation in squared stock price changes (stochastic volatility), and more persistent serial correlation in stock trades than in squared stock price changes. We derive the dynamic relationships among the stock, the call option, and the put option and capture the leverage effect offered by options. We derive standard consistency results for the learning process and the convergence of an asset's quotes to the asset's true value. We also derive closed-form analytic results for expected calendar period price changes and trades, and we examine calendar period serial correlation properties of squared price changes and trades.